A New Species of *Ephedra* (Ephedraceae) from China

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ABSTRACT. A new species, *Ephedra rituensis* Y. Yang, D. Z. Fu & G. Zhu, is described and illustrated. This species is similar to *Ephedra intermedia* Schrenk & C. A. Meyer in having bi- or tri-ovulate cones, and to *E. saxatilis* Royle ex Florin in having strong and well-developed woody stems and branchlets. It differs from *E. intermedia* mainly by the shorter micropylar tube straight or slightly curved and the less connate bracts of the uppermost whorl of female cones, and from *E. saxatilis* by the longer micropylar tube, the bi- or tri-ovulate female cones, more pairs or whorls of bracts, and the smaller seeds. The new species should be ascribed to *Ephedra* sect. *Pseudobaccatae* Stapf since its female cones bear fleshy bracts at maturity.

Key words: China, *Ephedra*, *Ephedra* sect. *Pseudobaccatae*, Ephedraceae.

Ephedra rituensis Y. Yang, D. Z. Fu & G. Zhu, sp. nov. TYPE: China. Xizang: Rutog Xian, 4600 m, (♀) 30 July 1974, *Xizang Exped. 3676* (holotype, HNWP; isotypes, PE, XJBI). Figure 1.

Haec species ad *Ephedram intermediam* et *E. saxatilem* maxime accedit, sed a hac strobilo foemineo bi- vel tri-ovulato bractearum paribus verticillisve multioribus munito, seminibus minoribus atque micropyles tubo longiore, ab illa micropyles tubo breviore recto vel leviter curvata distinguitur.

Dioecious subshrub, erect, to 50 cm tall, major stems lignified and woody, erect or procumbent, fawn-colored, sometimes ash-gray, up to 6 mm diam., ascendingly branched; branchlets stout, erect or suberect, yellowish green, flat at beginning, slightly warty when elderly, solitary, opposite or fasciculate, 1.8–2.9 mm diam., purplish brown medullated; internodes longitudinally striate, 1.4–3.9 cm long, 1.3–2.9 mm diam. Leaves white, membranous, 3–4 mm long, 2 or 3 at nodes, with 2 purplish brown veins in middle part, connate for 2/3–4/5 of total length, fused sheath cylindric, apices triangular, acute or acuminate, not recurved. Male cones sessile, solitary or opposite, 4–6 mm long, ovoid; bracts in 3 to 4 pairs, ovate, obtuse; synangia 6 to 8, sessile, densely aggregated on top of column. Female cones sessile, solitary, opposite or clustered, 5–7 mm long, 2.8–4 mm diam.; bracts in 4 or 5 pairs or whorls, those of uppermost whorl broadly ovate, apex obtuse, connate for 1/3–1/2 their length, red and fleshy at maturity, other whorls of bracts smaller and distinct from each other. Seeds 2 or 3, concealed by bracts, purplish brown, ovoid, ca. 5 mm long, ca. 3 mm wide, smooth, dorsally convex and ventrally plane, or carinate; micropylar tube straight or slightly curved, ca. 2.2 mm long, exserted.

Etymology. The specific epithet is derived from Chinese ping-yin of the county where the holotype of *Ephedra rituensis* was collected.

Distribution. *Ephedra rituensis* is found in some inaccessible localities of the Tibetan Plateau. Most specimens examined were collected from Xizang, China, but a few were found in Yecheng of southern Xinjiang and Qinghaihu of Qinghai, China.

Habitat. Newly described *Ephedra rituensis* grows in slightly divergent habitats at 3200–4600 m. The holotype was found in a dried river beach at 4600 m; other examined specimens were discovered in crevices of rocks, sand dunes, or dried gravel river beaches at 3200–4270 m. This species may live in a relatively moist condition since most specimens were collected near a river or lake.

Relationships. This new species is similar to *Ephedra intermedia* in having bi- or tri-ovulate cones, and to *E. saxatilis* in having strong and well-developed woody stems and branchlets. It differs from *E. intermedia* mainly by its shorter micropylar tube straight or slightly curved, the less connate bracts of the uppermost whorl, and the narrower female cones, and from *E. saxatilis* by its longer micropylar tube, bi- or tri-ovulate female cones,

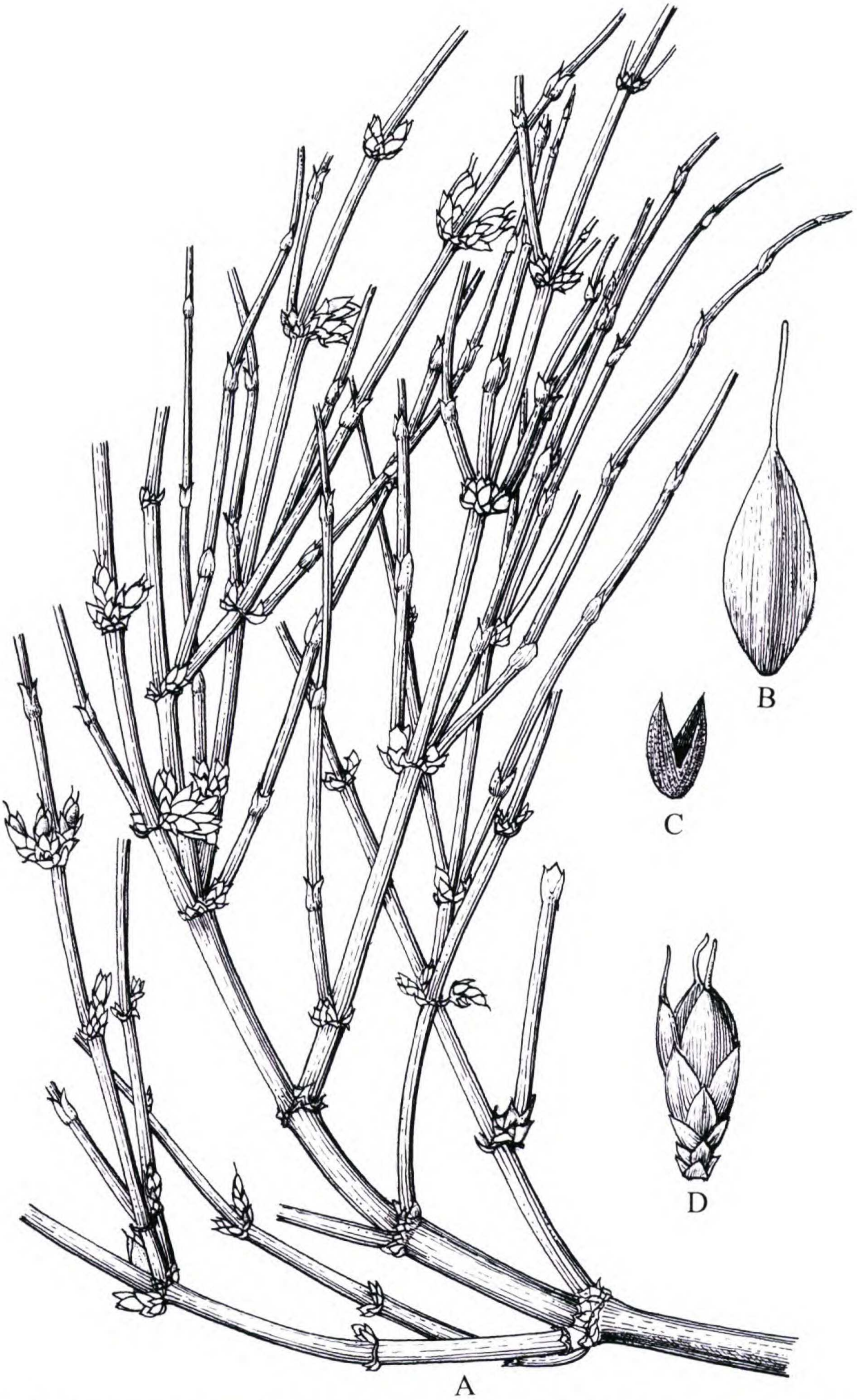

Figure 1. *Ephedra rituensis* Y. Yang, D. Z. Fu & G. Zhu (holotype). —A. Habit, female plant, ×1. —B. Seed, ×6. —C. The uppermost whorl of bracts to show the degree of fusion, ×2. —D. Female cone, ×3.

smaller seeds, and more pairs or whorls of bracts of female cones (Meyer, 1846; Stapf, 1889; Florin, 1933; Fu et al., 1999).

The most widely used sectional classification of *Ephedra* was made by Stapf (1889) based on the nature of bracts of female cones, although there are different opinions (Soskov, 1968; Pachomova, 1971; Mussayev, 1978). Bracts of female cones in *Ephedra* at maturity may be fleshy, coriaceous, or membranous, representing section *Pseudobaccatae*, section *Asarca*, and section *Alatae*, respectively (Stapf, 1889). This newly described species clearly belongs to *Ephedra* sect. *Pseudobaccatae*.

Paratypes. CHINA. **Xizang:** Burang Xian, (♀) 18 Aug. 1974, *Tibet Exped. 3999* (HNWP, XJBI); Burang Xian, (♂), *Vegetation Group, Qianghai-Xizang Exped. 13006* (PE); Rutog Xian, (♀) 14 Sep. 1976, *Vegetation Group, Qinghai-Xizang Exped. 13665* (PE); Gyirong Xian, (♀) 30 July 1975, *Wu C. Y., Chen S. K., Du Q. & Lu S. L. 75–493* (PE); Zhag'yab Xian, (♀) 1 Sep. 1976, *Qingzang Exped. 12981* (PE). **Xinjiang:** Yecheng, (♀) 23 Aug. 1987, *Wu Y. H. 1172* (PE). **Qinghai:** Qinghaihu, 1 July 1958, *Tsoong Pu-Chiu 8329* (PE).

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